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When magnesium oxide and fly ash are used together, water reduction improved by an order of magnitude in the above example.

EXAMPLE 4

Gypsum cubes were made according to the method of Example 1 using the siloxane dosage and catalyst composition shown in Table 4. Results of water absorption tests are also shown in Table V.

TABLE V

Stucco Source	Siloxane Dosage	MgO	Fly Ash	Water Absorption
Empire	4.2 g	1.2 g	0	6.1%
"	4.2 g	0	6.0 g	32%
"	3.1 g	1.2 g	6.0 g	3.7%
Montreal	4.2 g	1.2 g	0	7%
"	4.2 g	0	6.0 g	40%
"	3.1 g	1.2 g	6.0 g	2.9%

These tests were performed on stuccos with which it is particularly difficult to obtain satisfactory water resistance. Neither fly ash nor MgO alone were able to produce the desired standard of less than 5% water absorption. However, when both catalysts were used together, absorption well below the standard was achieved, even with a lower dosage of siloxane.

EXAMPLE 5

A plant trial was held testing this catalyst in wallboard on a commercial scale. The composition of the wallboard is shown in Table VI.

TABLE VI

Component	Amount, lbs/MSF
Stucco	1324
Gauging Water	546
Siloxane Water	119
Foam Water	75
Siloxane	10.5
MgO	4
Fly Ash	10.85
Soap	0.4
HRA Set Accelerator	16.6
Trimetaphosphate	0.8
LC-211	3.0
USG 95 Starch	3.5
Thickener	0.49
Daxad Dispersant	5.5
Foam Air	17 ft ³ /MSF

HRA, Trimetaphosphate, USG95, thickener, Daxad, LC-211, Fly ash and MgO were added to the dry stucco. The siloxane water and siloxane were mixed in a high speed mixer at high speed for less than 1 minute to make a stable suspension of siloxane in water. The suspension was then pumped to

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the slurry mixer and combined with the gauging water, the catalyst/stucco blend. Residence in the mixer was less than 15 seconds. As the slurry was discharged from the mixer, foam, made of the soap, foam air and foam water was inserted into the slurry to reduce the product density.

TABLE VI

Sample	Water Absorption
1A	4.11%
1B	4.36%
2A	4.34%
2B	4.37%
3A	4.19%
4B	4.06%

Cubes were made from a slurry sample according to ASTM C1396. Results of the soak tests are shown in Table VI. These tests confirm that wallboard having less than 5% water absorption are producible in a commercial setting using the catalyst, slurry and method of this invention.

While a particular embodiment of the fly ash and magnesium oxide catalyst for siloxane polymerization has been shown and described, it will be appreciated by those skilled in the art that changes and modifications may be made thereto without departing from the invention in its broader aspects and as set forth in the following claims.

What is claimed is:

1. A method of making a water-resistant gypsum article comprising:

making a siloxane emulsion with siloxane and water; mixing magnesium oxide and Class C fly ash with stucco, thereby forming a stucco/catalyst mixture; combining the siloxane emulsion with the stucco/catalyst mixture, thereby forming a gypsum slurry; shaping the gypsum slurry; allowing the gypsum slurry to set, thereby forming a core; and polymerizing the siloxane.

2. The method of claim 1 wherein said making step comprises mixing the siloxane and water in a high shear mixer.

3. The method of claim 1 wherein said shaping step comprises sandwiching the slurry between two pieces of facing material to foam a wallboard panel.

4. The method of claim 1 wherein said mixing step takes place before said combining step.

5. The method of claim 1 further comprising taking a portion of a metered amount of gauging water for use as the water.

6. The method of claim 1, further comprising adding a pregelatinized starch.

7. The method of claim 6 wherein the pregelatinized starch is added in amounts of about 3 to about 20 lbs/MSF.

8. The method of claim 6 wherein the pregelatinized starch is added in amounts of about 0.5% to about 10% by weight of the set gypsum composition.

9. The method of claim 6 wherein the pregelatinized starch comprises a corn starch.

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